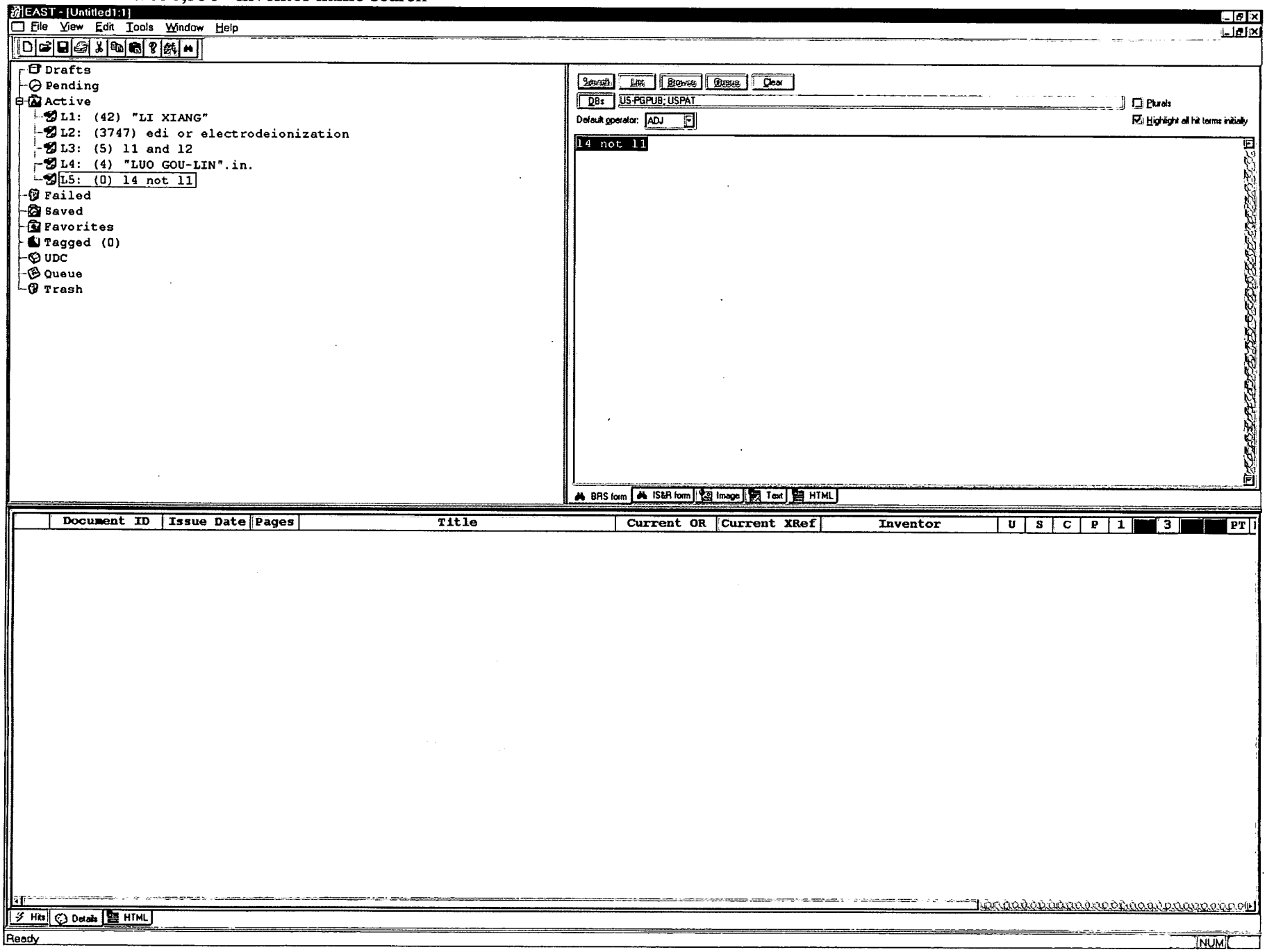
9/2005 SN 10/630,338 inventor name search



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- Drafts
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  - L1: (43) (204/639).CCLS.
  - L2: (40) (204/638).CCLS.
  - L3: (45) (204/636).CCLS.
  - L4: (112) l1 or l2 or l3
  - L5: (614617) bar or bars
  - L6: (4) l4 and l5
  - L7: (859296) frame or frames
  - L8: (33) l4 and l7
  - L9: (418) membrane adj (bag or bags)
  - L10: (1) l9 and l4
  - L11: (706) (204/627-640).CCLS.
  - L12: (88236) l5 same l7
  - L13: (10) l12 and l11
  - L14: (9) l13 not l6
  - L15: (5) l9 and l11
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DBs: US-PGPUB; USPAT

Plurals

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	Document ID	Issue Date	Pages	Title	Current OR	Current XRef	Inventor	U	S	C	P	1		3			PT
1	US 20040112752 A1	20040617	5	EDI device with resin seepage-proof inserts	204/632	204/633	Li, Xiang et al.	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐
2	US 20040055887 A1	20040325	5	EDI device with composite electrode	204/632	204/524	Li, Xiang et al.	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐
3	US 6190528 B1	20010220	9	Helical electrodeionization apparatus	204/632	204/633	Li; Xiang et al.	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐
4	US 4639300 A	19870127	9	Method and apparatus for electrofiltration	210/638	204/516; 204/517;	Culkin; Joseph B.	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐
5	US 3657105 A	19720418	4	ELECTRODIALYSIS APPARATUS	204/627		Veld; Willem In'T	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐

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	Document ID	Page	1		3			U	S	C	P	PT	Source	Current OR	Current XR
10	US 5925255 A	35							☑				USPAT	210/652	210/638;
11	US 5868915 A	15							☑				USPAT	204/524	204/533;
12	US 5858191 A	15							☑				USPAT	204/524	204/529;
13	US 5425858 A	29							☑				USPAT	204/450	204/164;
14	US 5376253 A	10							☑				USPAT	204/632	204/633
15	US 5316637 A	22						☑					USPAT	204/533	204/632;

US-PAT-NO: 5376253

DOCUMENT-IDENTIFIER: US 5376253 A

TITLE: Apparatus for the continuous electrochemical desalination of aqueous solutions

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US Patent No. - PN (1):
5376253

US005376253A

United States Patent [19]

Rychen et al.

[11] **Patent Number: 5,376,253**

[45] **Date of Patent: Dec. 27, 1994**

[54] **APPARATUS FOR THE CONTINUOUS ELECTROCHEMICAL DESALINATION OF AQUEOUS SOLUTIONS**

[75] Inventors: **Philippe Rychen**, Muespach-le-Haut, France; **Samuel Alonso**, Aesch, Switzerland; **Hans P. Alt**, Rheinfelden, Germany; **Dominique Genebrittel**, Huningue, France

[73] Assignee: **Christ AG**, Aesch, Switzerland

[21] Appl. No.: **59,761**

[22] Filed: **May 12, 1993**

[30] **Foreign Application Priority Data**

May 15, 1992 [CH] Switzerland 01 569/92-5
Nov. 24, 1992 [CH] Switzerland 03 627/92-3

[51] Int. Cl.[5] B01D 61/44; C02F 1/469
[52] U.S. Cl. 204/301; 204/182.4; 204/182.5
[58] Field of Search 204/301, 182.4, 182.5

[56] **References Cited**

U.S. PATENT DOCUMENTS

2,650,709	9/1953	Rosenak et al.	210/8.5
2,741,991	4/1956	Dewey II, et al.	204/180
3,585,131	6/1971	Esmond	210/321
4,225,413	9/1980	Kern	204/301
4,227,295	10/1980	Bodnar et al.	29/527.3
4,931,160	6/1990	Giuffrida	204/301
4,956,071	9/1990	Giuffrida et al.	204/301
4,964,970	10/1990	O'Hare	204/301

FOREIGN PATENT DOCUMENTS

0113387	5/1991	European Pat. Off. .	
2267118	11/1975	France .	
489654	8/1938	United Kingdom .	
1192531	5/1970	United Kingdom .	

OTHER PUBLICATIONS

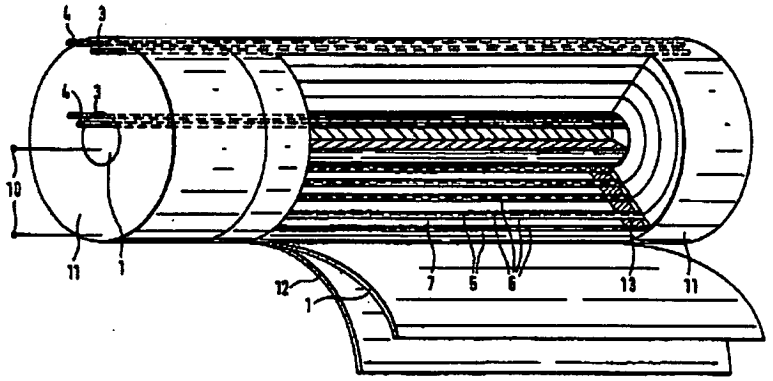
Desalination 16, 225-233 (1975), Elsevier Scientific Publishing Co., Amsterdam.

Primary Examiner—John Niebling
Assistant Examiner—Arun S. Phasge
Attorney, Agent, or Firm—Wenderoth, Lind & Ponack

[57] **ABSTRACT**

An apparatus for the continuous electrochemical desalination of aqueous solutions includes a wound module having a central electrode, around which are wound an anion exchanger membrane and a cation exchanger membrane, and an outer counterelectrode. Each membrane is sealed at an inner edge thereof and at a outer edge by a respective clamping device, or are anchored in a synthetic resin block, in such a way that a dilution chamber and a concentrate chamber are defined. The dilution chamber and/or the concentrate chamber may contain an ion exchanger resin. The central electrode and the outer counterelectrode each may have a constriction over at least a part of the circumference thereof. The central electrode may furthermore have a recess for receiving the inner clamping device or the inner synthetic resin block in order to achieve a winding having as spiral a cross section as possible.

19 Claims, 5 Drawing Sheets



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	Document ID	Page	1		3			U	S	C	P	PT	Source	Current OR	Current XR
19	US 5147722 A	27							☑				USPAT	428/402	264/122;
20	US 4931160 A	14							☑				USPAT	204/632	
21	US 4925541 A	20							☑				USPAT	204/524	
22	US 4753681 A	3							☑				USPAT	134/22.17	134/2;
23	US 4225413 A	5							☑				USPAT	204/630	
24	US 2815320 A	18						☑					USPAT	204/524	204/535;

US-PAT-NO: 4225413

DOCUMENT-IDENTIFIER: US 4225413 A

TITLE: Spiral wound electrodialysis cell

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US Patent No. - PN (1):
4225413

United States Patent [19]

Karn

[11] **4,225,413**

[45] **Sep. 30, 1980**

[54] **SPIRAL WOUND ELECTRODIALYSIS CELL**

[76] Inventor: **William S. Karn, 518 Dickson Ave., Pittsburgh, Pa. 15202**

[21] Appl. No.: **41,937**

[22] Filed: **May 24, 1979**

[51] Int. Cl.² **B01D 13/02**

[52] U.S. Cl. ..... **204/301; 204/180 P**

[58] Field of Search ..... **204/301, 180 P**

[56] **References Cited**

U.S. PATENT DOCUMENTS

2,741,595	4/1956	Juda	204/301
3,869,375	3/1975	Ono et al.	204/301

Primary Examiner—Arthur C. Prescott

[57] **ABSTRACT**

Two ion selective semipermeable membranes, such as are used in electrodialysis cell assemblies, are joined to one another at their edges so as to form a pouch with ion permeable walls. The membranes are provided with end flow ports into the pouch region. The pouch is wound into a spiral so as to resemble a spiral wound reverse osmosis module. A central hub electrode and a peripheral cylindrical electrode are provided. With suitable electrolyte streams the system operates as an electrodialysis cell assembly.

11 Claims, 4 Drawing Figures